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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,332	11/14/2003	Roger L. Schultz	HES 2002-IP-008558U1	4043
29920	7590	08/24/2006	EXAMINER	
JOHN W. WUSTENBERG			WONG, ALBERT KANG	
P.O. BOX 1431			ART UNIT	
DUNCAN, OK 73536			PAPER NUMBER	
			2612	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/714,332	Applicant(s) SCHULTZ ET AL.	
	Examiner Albert K. Wong	Art Unit 2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 May 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-133 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-133 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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1. This Office action is in response to the election filed June 5, 2006. Claims 1-133 are pending. Claims 134-135 have been canceled as requested. Applicants' election of species I without traverse is acknowledged. Item 23 cited on the IDS has not been considered since the reference has not been received.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-121 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 15, 23, 42, 60, 76, 92, and 108, it is not clear how the determining step is related to the of the steps since there is not cooperative relationship between the determining step and the other steps.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rorden (3,967,201).

Regarding claim 1, the steps of selecting a transmission frequency and positioning a transceiver a distance apart is conventional. A walkie-talkie is a common example of such a system. Rorden teaches the implementation of a communication system within a lossy environment. It is noted that the claim does not the selecting and positioning steps to be within a lossy environment. One of ordinary skill in the art would be aware of unique problems while communicating in a lossy environment. Gottlieb teaches the effect of signal attenuation when signals are transmitted within a lossy environment. It would have been obvious to determine the attenuation factor to estimate the maximum distance between the receiver and transmitter.

Regarding claims 2-6, the determination of the distance for various levels of signal attenuation would have been obvious since such information is necessary to properly design a communication system. The signal attenuation determines the amount of power necessary to assure proper communications.

Regarding claim 7, see Rorden.

Regarding claims 8-9, it is well recognized that transmissions through a non-air medium constitutes a lossy environment. A mineshaft is analogous to a wellbore and a cave is recognized as a lossy environment. It would have been obvious to use the same steps to create a communication system in any lossy environment.

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Regarding claim 10, see Figure 2 of Rorden which shows graphs approximating the claimed transmission frequency range.

Regarding claim 11, Figure 2 of Rorden shows the attenuation with regards to conductivity (which is the inverse of resistivity). Since the two parameters are related, it would have been obvious that one must determine the formation resistivity to predict the attenuation.

Regarding claim 12, the location of a receiver at the surface as shown in Rorden would place a transceiver outside the lossy environment.

Regarding claim 13, see Figure 1 of Rorden.

Regarding claim 14, it would have been obvious to position transceivers at locations with the same signal attenuation so that identical transceivers may be used at each location.

Regarding claim 15, Rorden teaches the determination of the optimal frequency in a borehole. Transceivers are positioned at given distances and an optimum frequency is selected. As shown in figure 1, the resistivity of the borehole is known. This is typically done via a logging process. Rorden does not specifically teach the determination of the attenuation profile for a selected length. Gottlieb teaches a method for modeling attenuation profile based on parameters from the lossy media. It would have been obvious to use the determination of the attenuation profile to optimized the frequency and placement of the transceivers as suggested by Rorden.

Regarding claims 16-22, these limitations have been addressed above.

Regarding claim 23, the steps of determining the attenuation factor, selecting the frequency, positioning the transceivers, and transmitting the signal has generally been addressed

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in claim 12. It would have been obvious to place the transceivers within range to ensure communication.

Regarding claims 24, Rorden teaches the use of transceivers within the lossy environment to transmit signals outside the environment.

Regarding claim 25, the use of transceivers as relays is well known in the art. It would have been obvious to use a transceiver as a relay to extend the communication range.

Regarding claims 26-32, 34, and 40, these limitations have been addressed in prior claims.

Regarding claim 33, a cave is a lossy environment with a natural opening. The use of a transmission system in a cave has been addressed above.

Regarding claim 35, the determination of the resistivity of the formation is directed toward the path of transmission since other paths would not be of interest.

Regarding claim 36-39, Rorden teaches the determination of an optimum transmission frequency. It would have been obvious to automatically change the frequency to adjust of changing conditions. Within the communication art, it is well known to create a dynamic system that changes frequency or channel compensation factors to optimize communications. Gottlieb teaches that lower frequencies have lower attenuation. Thus, it would have been obvious to switch to lower frequencies when communication is interrupted.

Regarding claim 41, it is conventional for a repeater to retransmit signals on a different frequency to avoid interference since the original signal propagate past the transceiver for an indeterminate distance.

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Regarding claim 42, this is essentially the same as claim 1 with the addition of the transmission step. Rorden teaches the transmission of a signal from a transceiver to another via the lossy environment.

Regarding claims 43-59, these limitations have been addressed above.

Regarding claim 60, this is essentially the same as claim 15 with the additional steps of transmitting a signal from a surface receiver. The surface transceiver is shown as item 22. Thus, the surface transceiver is able to send command signals through the lossy medium to the receivers below.

Regarding claims 61-75, these limitations have been addressed above.

Regarding claim 76, this claim is essentially the same as claim 60 with the addition of an intermediate transceiver. This is shown as item 18'.

Regarding claims 77-91, these limitations have been addressed above.

Regarding claims 92 and 108, all of the steps have been addressed in prior claims with the exception of the step of forming the passageway/drilling a borehole. The wellbore shown in figure 1 of Rorden obviously requires the step of either forming a passageway through the formation or drilling a borehole.

Regarding claims 93-107 and 109-121, these limitations have been addressed above.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 122 and 124 are rejected under 35 U.S.C. 102(b) as being anticipated by Rorden.

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Regarding claim 122, the transceivers are shown as items 18 and 18'.

Regarding claim 124, see figure 1.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 123 and 125-133 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rorden.

Regarding claims 123, 128, 129, 130, and 131, the distance for various levels of signal attenuation would have been obvious since such information is necessary to properly design a communication system. The signal attenuation determines the amount of power necessary to assure proper communications.

Regarding claims 125-126, it is well recognized that transmissions through a non-air medium constitutes a lossy environment. A mineshaft is analogous to a wellbore and a cave is recognized as a lossy environment. It would have been obvious to use the same steps to create a communication system in any lossy environment.

Regarding claim 127, see Figure 2 of Rorden which shows graphs approximating the claimed transmission frequency range.

Regarding claim 132, it would have been obvious that the distance between transceivers would be identical if the formation characteristics provided the same level of signal attenuation.

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Regarding claim 133, it would have been obvious to position transceivers at locations with the same signal attenuation so that identical transceivers may be used at each location.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert K. Wong whose telephone number is 571-272-3057. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 571-272-7308. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Albert K. Wong
August 15, 2006

ALBERT K. WONG
PRIMARY EXAMINER